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NORMAL FARM PRICE OF HOGS

This report summarizes the methods used in establishing a United States normal price of \$7.00 per 100 pounds for hogs. These methods included an analysis of probable trends in the production, consumption, exports, and price of hogs as follows:

Hog Production Related to Corn Production

As the data listed below indicate, corn normally accounts for over 70 percent of the feeds, exclusive of roughage, consumed by hogs in the United States. Because of this importance of corn in the feeding of hogs, probable trends in the future production of hogs will be influenced by the quantity of corn available for feeding hogs as determined by trends in the production and utilization of corn.

Period	Feed, exclusive of roughages, consumed by hogs in the United States <sup>a/</sup>	Corn consumed by hogs in the United States <sup>a/</sup>	Corn as a percent of the total
	(Thousands of tons)	(Percent)	
1926 - '29 av.	37,310	27,584	74
1930 - '34 av.	34,559	25,542	74
1935 - '39 av.	33,385	23,568	71
1940 - '44 av.	48,587	34,438	71

Corn Production Expected To Be Large

It is now generally expected by most persons familiar with trends in corn production that future crops of corn in the United States will average near 3 billion bushels per year as compared with the average of 2.9 billion bushels during 1942-47 and 2.6 billion bushels in the period 1937-41 (see figure 1 at the end of this report).

The estimate of a 3 billion bushel corn crop is based in part on the probability there will be about 90 million acres in corn in the future. Prior to 1933, the United States normally harvested somewhat more than 100 million acres of corn but this acreage has since been reduced to a range of 85 to 95 million acres due to increased emphasis on soil conserving crops (figure 1). It is possible that as the production of certain crops temporarily expanded during the war, such as oats and soybeans, is reduced in the future some of the acreage now in these crops may become available for corn but this analysis assumes this released acreage is more likely to be absorbed by increases in the acreage of hay, legumes, and other soil conserving crops.

Prior to 1935, corn yields in the United States averaged 26.6 bushels per acre but the trend in yields has since been upward and during 1942-47 corn

<sup>a/</sup> As estimated by the Bureau of Agricultural Economics.



yields averaged 33 bushels (see figure 1). Increasing use and improvement of hybrid seeds, greater use of fertilizers, and a wider application of mechanization to insure better timing in planting and harvesting operations have been the main causes of this rise in yields. While improved weather conditions also have contributed to the higher yields, commodity and farm management specialists believe that a large part of the gain in yields is permanent and that after allowance is made for further progress, an average yield of 33 bushels per acre may be looked for in the future. On 90 million acres this 33 bushel yield would result in an annual crop of 3 billion bushels of corn.

#### Hog Production Likely to Remain Near Present Levels

The forecast of a 3 billion bushel corn crop may be used to estimate the probable future production of hogs.

It is apparent from the lower section of figure 2 that the production of hogs per bushel of corn in the United States declined from about  $8\frac{1}{2}$  pounds of hogs, live weight, per bushel of corn produced around 1870 to only  $4\frac{1}{2}$  pounds in 1905. Increased feeding of corn to other kinds of livestock and poultry was the primary cause of this decline in the ratio of hog production to corn production. However, as efficiency in the raising of hogs was increased by eliminating death losses, improving feeding practices, and by using larger quantities of supplementary feeds, the number of pounds of hogs raised per bushel of corn produced increased after 1905 to  $6\frac{1}{2}$  pounds by 1930. Since 1931, an average of 6.65 pounds of hogs, live weight, have been raised per bushel of corn produced.

This analysis assumes the United States will continue to produce about 6.65 pounds of hogs per bushel of corn. On this basis, an average production of 20 billion pounds of hogs, live weight, per year may be expected for the future if the corn crop averages 3 billion bushels a year. Such a volume of hog production would compare with levels for past years as follows:

Period	Production of hogs live weight	Equivalent production of pork dressed weight	Equivalent production of lard	Equivalent slaughter of hogs	Equivalent pig crop required
Actual data:	(Millions of pounds)				(Million of hogs)
1935-39 av.....	13,522	7,337	1,624	56.8	68.6
1940-44 av.....	20,360	11,478	2,450	84.2	95.6
1945 .....	19,096	10,697	2,010	71.9	86.8
1946 .....	19,093	11,173	2,114	76.2	83.0
Forecast for future .....	20,000	11,250	2,400	82.6	95.7



### Consumption of Hog Products Rising

Total domestic consumption of pork (excluding lard) has followed a long-term rising trend, increasing from  $5\frac{1}{2}$  billion pounds dressed weight in 1900 to an annual rate of about 10 billion pounds in recent years (see figure 3). This rise in consumption has resulted entirely from population increases. As figure 3 indicates, domestic per capita consumption of pork, while fluctuating, has followed an approximately level trend and has averaged 67 pounds, dressed weight, per person.

Trends in the domestic consumption of lard have been similar to those for pork. Total consumption of lard has increased along with population, from 1 billion pounds in 1900 to nearly 2 billion pounds in recent years. Per capita consumption of lard has followed a slight upward trend, having averaged 12.8 pounds in the years since 1920 as compared with an average of 12.1 pounds in the period 1900-19 (see figure 3).

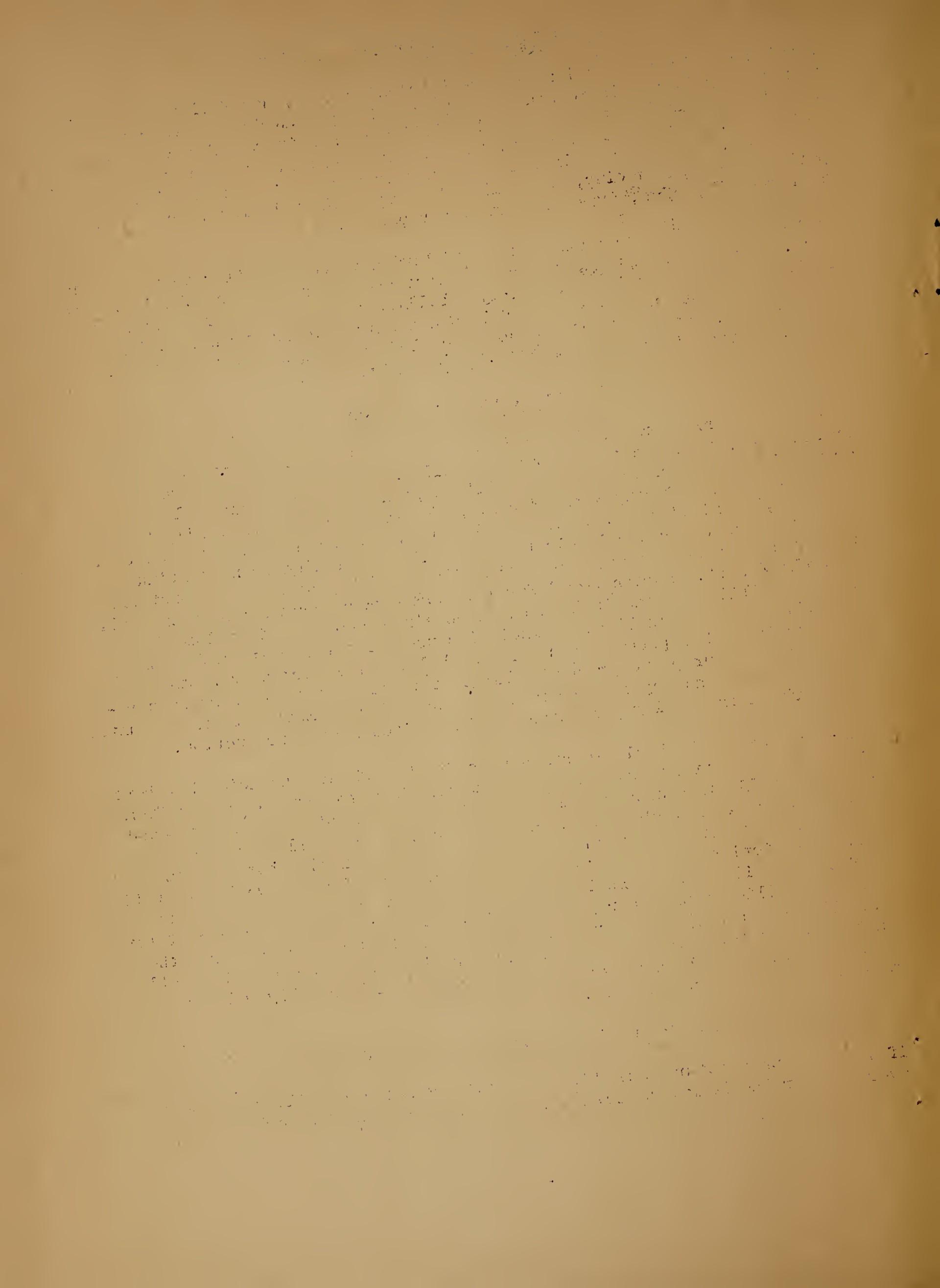
### Export Trends Are Downward

Exports of pork from the United States have followed a long-term downward trend. They declined from about 900 million pounds, dressed weight, around 1900 to an average of 432 million pounds annually during 1910-14 (see figure 3). During World War I, pork exports rose temporarily to nearly 2,000 million pounds in 1919 but they receded rapidly, thereafter, and were back to prewar levels by 1926. This declining trend continued until pork exports averaged less than 150 million pounds a year just prior to World War II. During World War II, pork exports again rose temporarily to 1,585 million pounds in 1943 but have since decreased in volume to 570 million pounds in 1946. Principal causes of the long-term declining tendency in pork exports have been the ability of important consuming areas such as Europe to produce a large proportion of their pork requirements and the tendency for the rising volume of consumption in this country to absorb an increasing percentage of the United States production.

Long-term trends in lard exports have reflected mixed tendencies but here again the basic trend probably is downward. Lard exports decreased from about 600 million pounds annually around 1900 to about 500 million pounds at the outbreak of World War I. In the decade after World War I lard exports rose to an average of 800 million pounds annually but as world trade restrictions and competition from a rising volume of world production of fats and oils made themselves felt, exports decreased after 1930 to only 200 million pounds per year by 1940. Present world shortages of fats and oils undoubtedly will again tend to stimulate lard exports from the United States for a period after World War II but, as recovery in world fats and oil production progresses, exports of lard probably will once more decrease to lower levels.

### Hog Production Expected To Be Adequate

If it is assumed future domestic per capita consumption will continue to average near the long established levels of 67 pounds for pork and



12.8 pounds for lard, estimates of probably future total consumption of hog products may be derived from population trends for comparison with the estimated future production of hog products as follows:

Period	Pork				Lard				U. S. population
	U. S. production	U. S. consumption	Available for exports	Actual exports	U. S. production	U. S. consumption	Available for exports	Actual exports	
Actual data:	(Millions of pounds)								(Millions)
1935-39 av.	7,337	7,286	51	a/143	1,624	1,424	200	166	129.0
1940-44 av.	11,478	10,228	1,250	947	2,450	1,802	648	574	134.9
1945	10,697	9,927	770	a/879	2,010	1,719	291	a/613	139.6
1946	11,173	10,774	399	a/573	2,114	1,662	452	444	141.2
Forecast:									
1950	11,250	9,882	1,368	-	2,400	1,885	515	-	147.3
1955	11,250	10,176	1,074	-	2,400	1,941	459	-	151.7
1960	11,250	10,413	837	-	2,400	1,986	414	-	155.2

These data indicate that on the average from 837 to 1,368 million pounds of pork will be available for export in the future. Because it seems improbable that exports of pork in the future will average more than 400 to 600 million pounds annually, it appears there may be a tendency toward an over production of pork. The estimated quantities of lard available for export in the future range from 414 to 515 million pounds. Export markets will probably easily absorb this much lard during the next 3 to 5 years but as world production of fats and oils recovers, total lard exports may fall below the supplies that will be available for export.

While this analysis indicates there may be a tendency toward an over production of pork and possibly also of lard in the future, it should be noted that relatively small changes in the estimated trends - a 5 percent lower level of hog production and a 5 percent higher volume of domestic consumption - would eliminate the anticipated surpluses. However, because the prospective surpluses have been estimated from well established trends in hog production, consumption, and exports, it is assumed there will be a tendency to over produce hogs in the future.

#### Normal Farm Price of Hogs

Trends since 1870 in the actual level of prices received for hogs by farmers in the United States are shown in the upper section of figure 4. Between 1870 and 1900, the price fluctuated mostly from \$3.50 to \$5.50 per 100 pounds. Following 1900, the price rose steadily, reaching an

<sup>a/</sup> Actual exports exceed quantities "available for exports" because the latter are not adjusted for changes in stocks and small quantities imported.



average of \$7.23 in the period 1910-14. During World War I, the price increased temporarily to a peak of \$16.39 in 1919 but declined thereafter to an average of \$7.76 during 1921-36. The price averaged \$7.59 in the period 1937-41 but rose to \$17.50 in 1946 and a new high of \$27.60 in 1947.

As a partial approach to estimating a normal price of hogs, it might be assumed that hog prices during the next 20 years will fluctuate in a pattern similar to that existing in the comparable 20-year period 1921-40 following World War I when the United States farm price of hogs averaged \$7.65. While this \$7.65 price might be looked on as a tentative estimate of the price which will exist during the next 20 years, it should be examined in connection with the probable outlook for hogs before being considered as a possible estimate of a normal price. Because it appears there may be a tendency to overproduce hogs the 1921-40 price of \$7.65 should be adjusted downward before being accepted as an estimate of normal. However, any downward adjustments made in this \$7.65 price probably should be of limited proportions in view of the fact that there may be future declines in available domestic per capita supplies of all meats, including pork. For these reasons, it would seem the \$7.65 price should be reduced moderately to an assumed level of perhaps \$7.25 in order to keep loans to hog producers on a sound basis. This tentative estimate of a United States normal price of \$7.25 is nearly the same as the 1910-14 price of \$7.23 but is somewhat lower than the price of \$7.59 existing in the period 1937-41, when hog prices were above their usual relation to other prices as a result of the after-effects of the liquidation of hog numbers caused by the AAA program and the droughts of 1934 and 1936.

Another approach to estimating a normal price for hogs would involve noting what level of hog prices would exist if the index of all farm prices in the future should average near an assumed level such as the 1909-14 average. The lower section of figure 4 shows the estimated level of "adjusted" hog prices that would have existed from 1870 to 1946 if the index of all farm prices in the United States had remained constantly at a level equal to its 1909-14 average <sup>a/</sup>. These adjusted prices followed a rising trend from 1870 to about 1910 but since 1910 the trend has been level and the adjusted price averaged \$6.80 in the period 1910-46. Because this adjusted price of \$6.80 seems to represent the level at which hog prices would average in relation to other prices with the index of all farm prices at its 1909-14 level, it may be used as a second tentative estimate of a United States normal price for hogs.

A difference of only \$0.45 exists between the prices of \$7.25 and \$6.80 derived above as tentative United States normal prices of hogs. The \$7.25 price is based on an attempt to realistically estimate the actual future price of hogs, while the \$6.80 represents the level of hog prices that would exist if the index of all farm prices in the future averages near some stable level such as its 1909-14 average. Since these prices

<sup>a/</sup> The "adjusted" prices shown in the lower section of figure 4 were computed by dividing the actual United States farm price of hogs in each year by the United States index of all farm prices (1909-14=100) for each year.



are only slightly different and both appear to be sound estimates, a compromise United States normal price of \$7.00 was adopted for hogs.

#### Normal Prices by Local Areas

To adapt it for use in making appraisals, the United States \$7.00 normal farm price of hogs has been converted to the equivalent local area prices shown in figure 5. These local normal prices have been worked out by United States Department of Agriculture crop reporting districts on a basis giving the hog price in each of these districts the same percentage relation to the \$7.00 United States price as existed for actual hog prices in the period 1932-41.

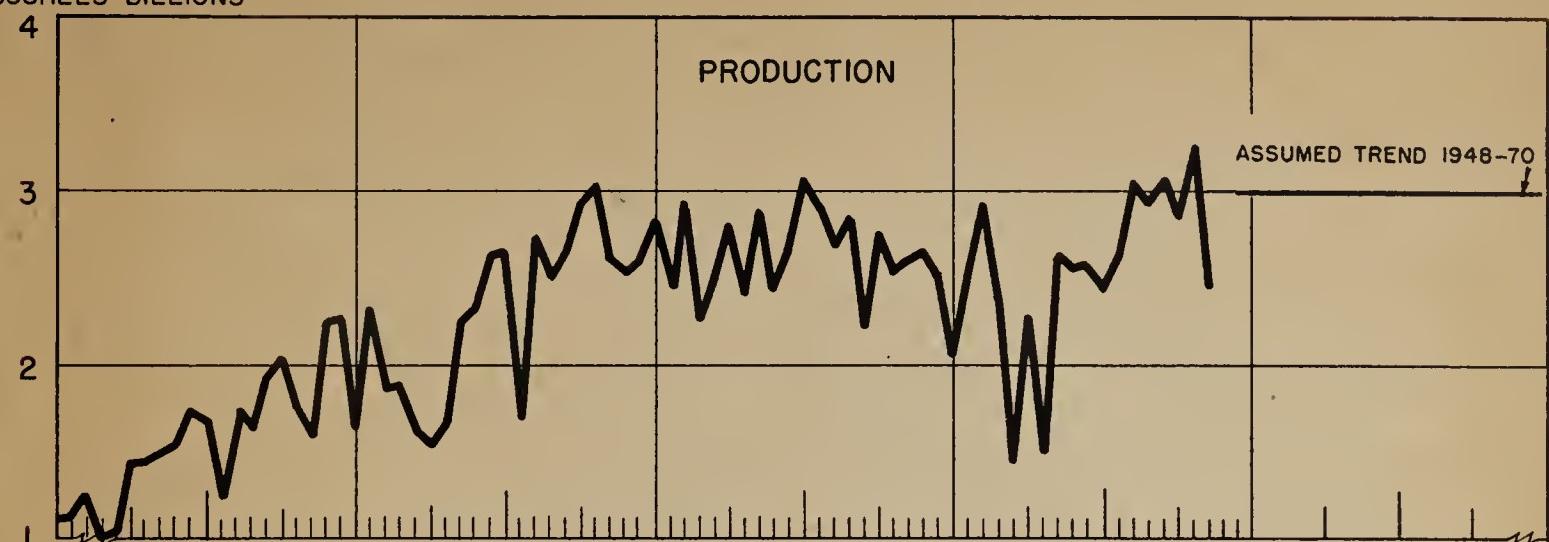
The local normal prices shown in figure 5 represent in each case normal prices equivalent to a United States average of \$7.00, without any rounding of the data or other adjustment. This method of presentation has the advantage of showing the normal prices for local areas in detail. However, since crop reporting district boundaries do not always correspond to type-of-farming areas, the Federal land bank, the appraisal office, and the Director of Research in each district often will find it desirable to smooth or round off these prices over areas larger than crop reporting districts. While such a rounding of the local normal prices will in many cases seem to be a desirable and necessary procedure, the rounded prices adopted for a given State should still average out to about the same level of prices for the State as is indicated by the prices for the State shown in figure 5.

Farm Credit Administration  
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Washington, D. C.  
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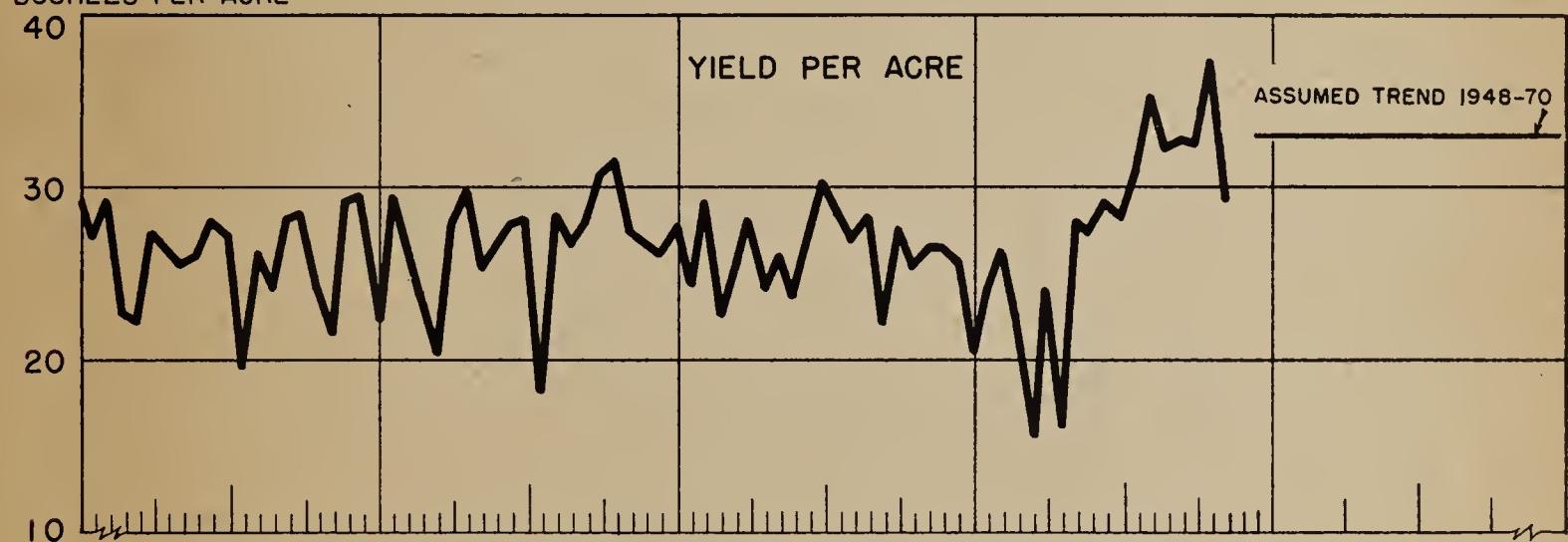


FIGURE I  
ALL CORN: PRODUCTION, HARVESTED YIELD PER  
ACRE, AND HARVESTED ACREAGE  
UNITED STATES

BUSHELS-BILLIONS



BUSHELS PER ACRE



ACRES-MILLIONS

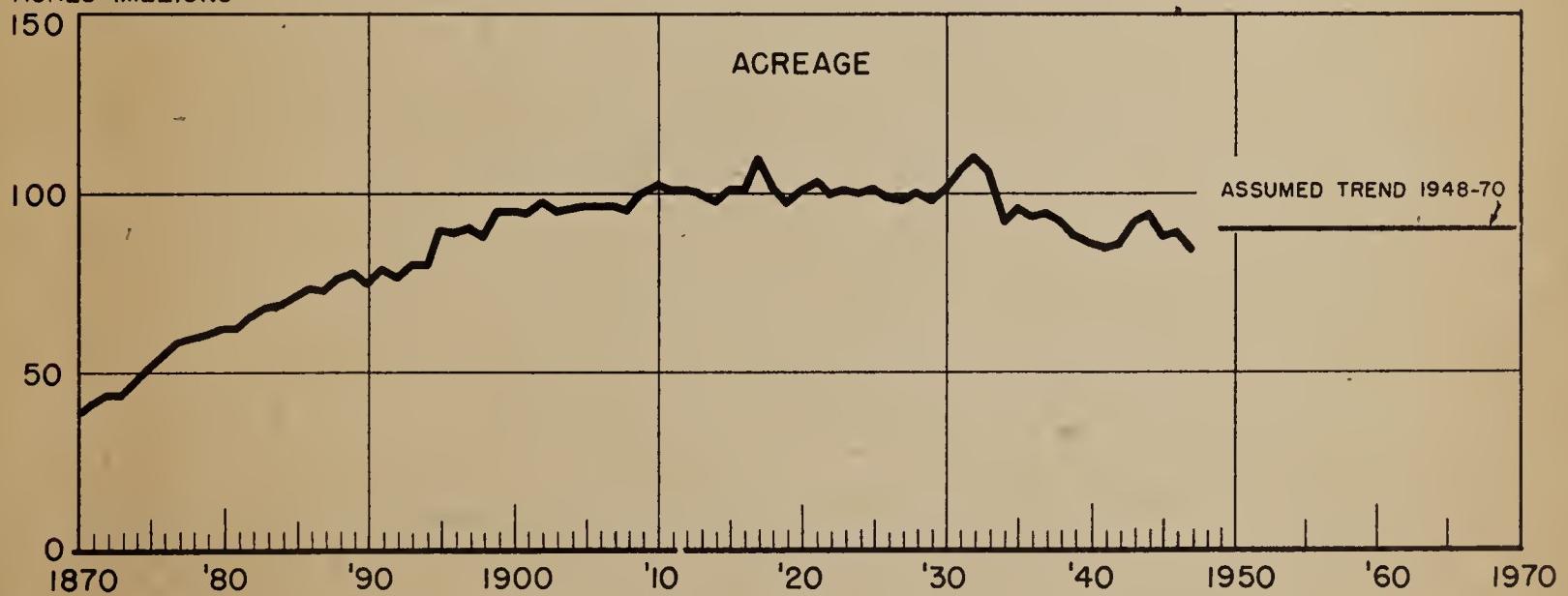
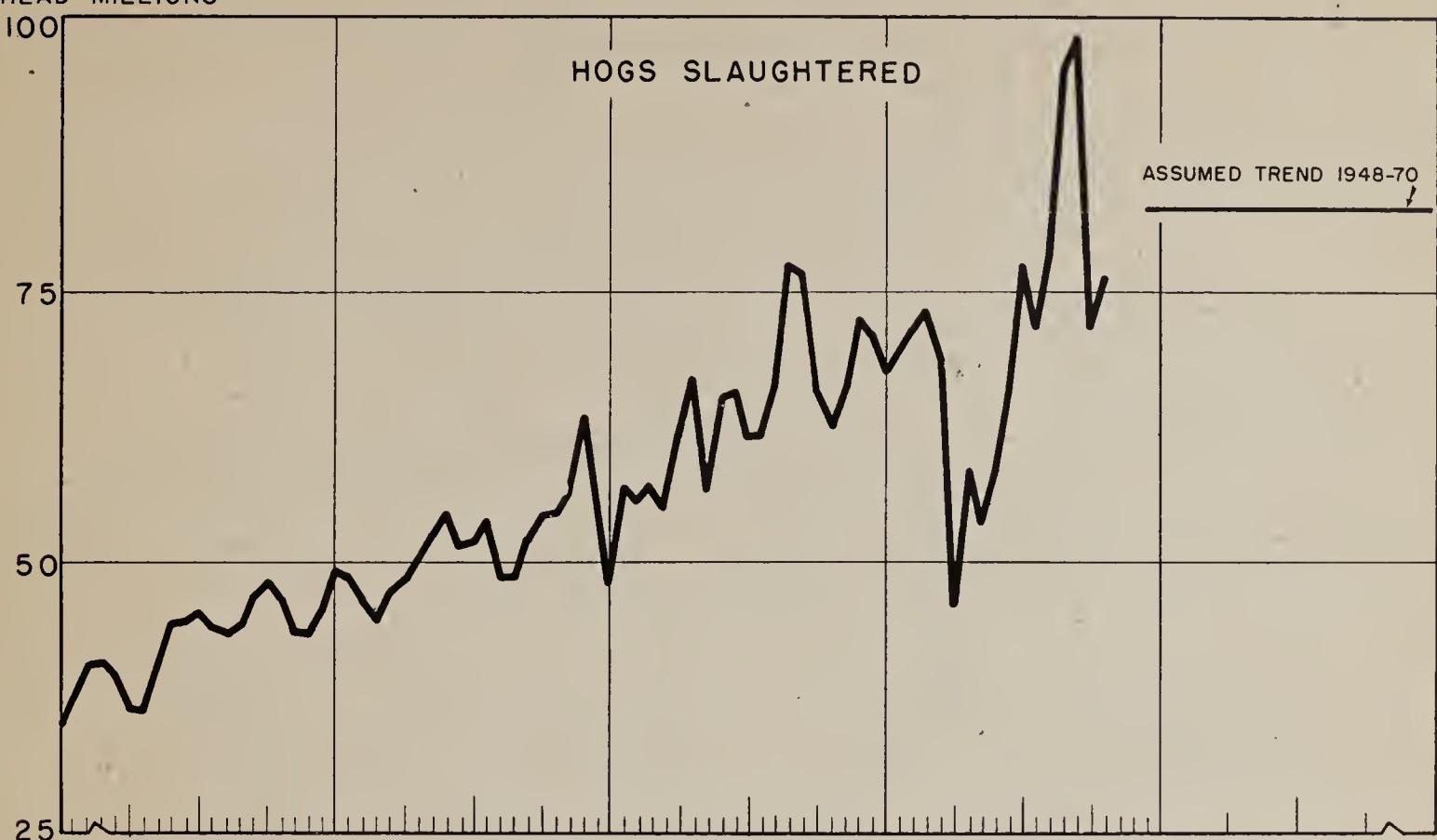




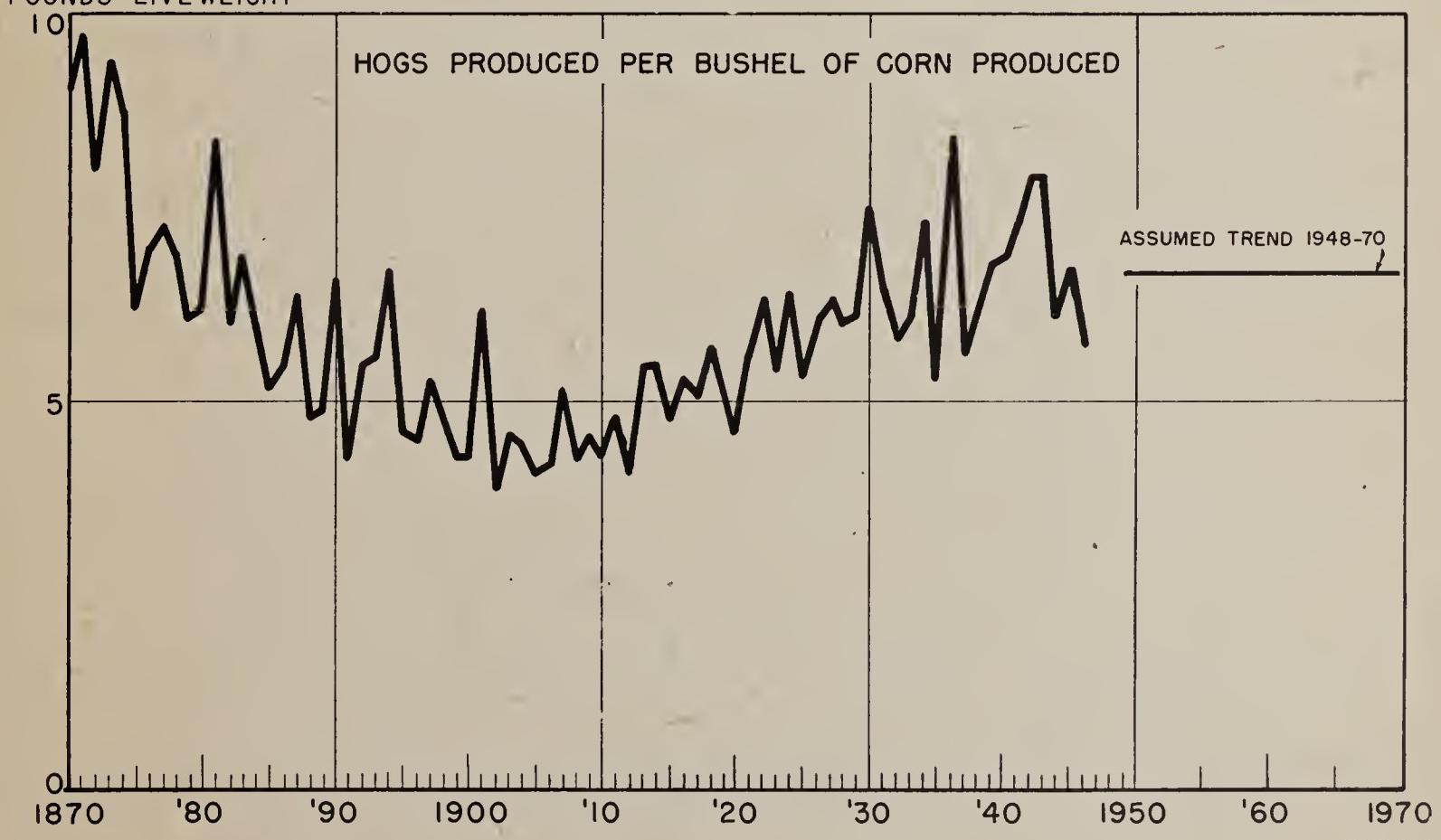
FIGURE 2

TOTAL NUMBER OF HOGS SLAUGHTERED, AND NUMBER  
OF POUNDS OF HOGS PRODUCED PER BUSHEL OF ALL  
CORN PRODUCED, UNITED STATES

HEAD - MILLIONS



POUNDS - LIVE WEIGHT



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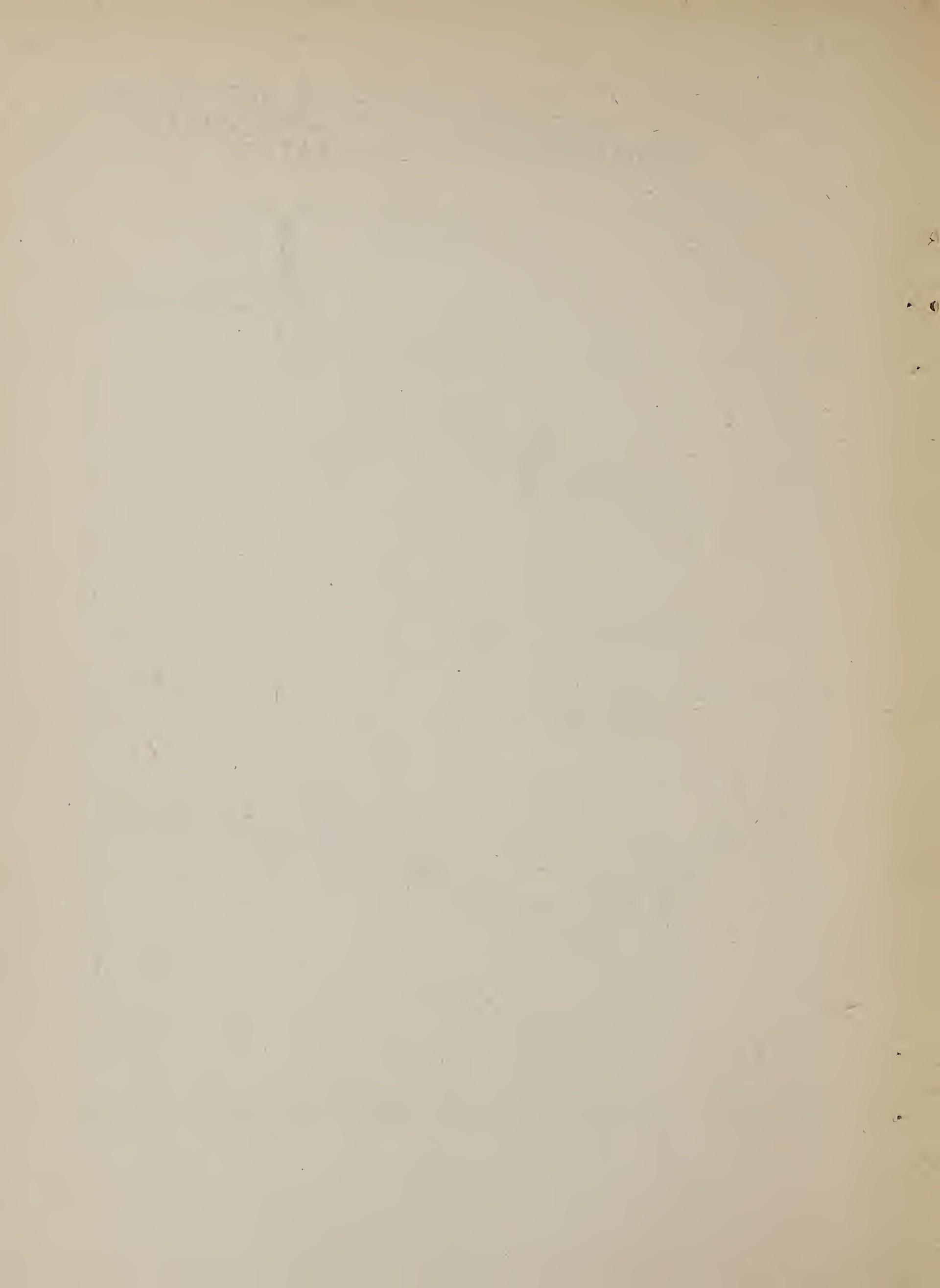
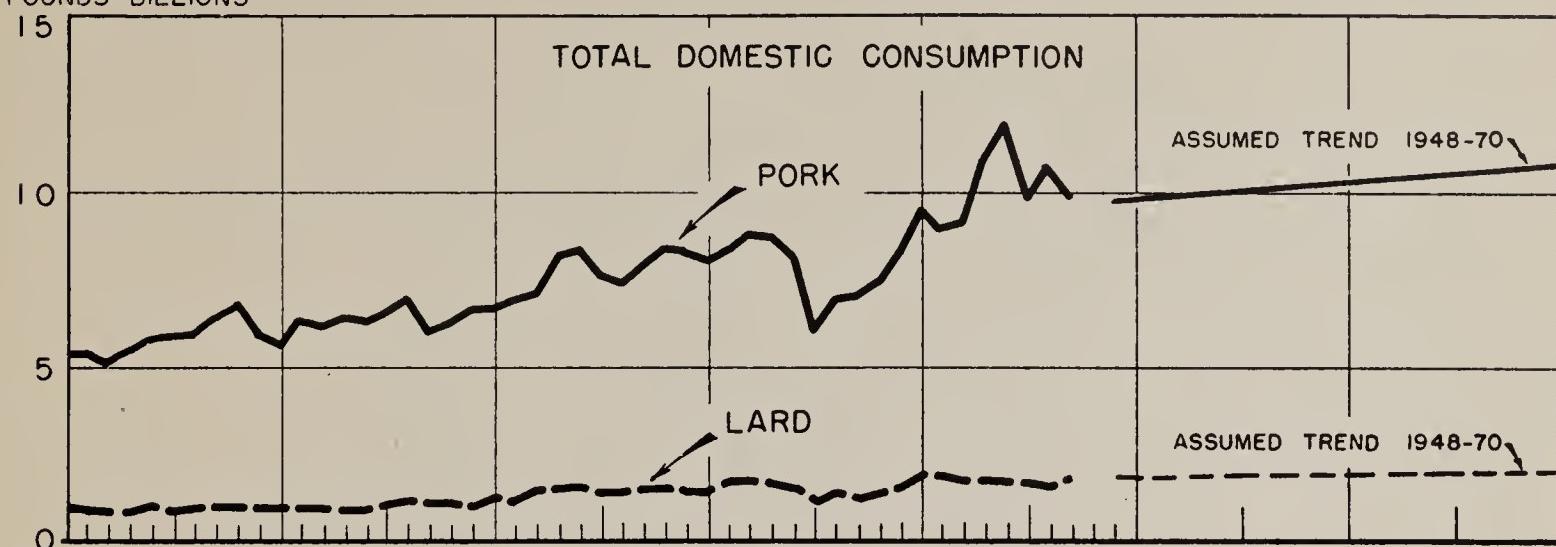


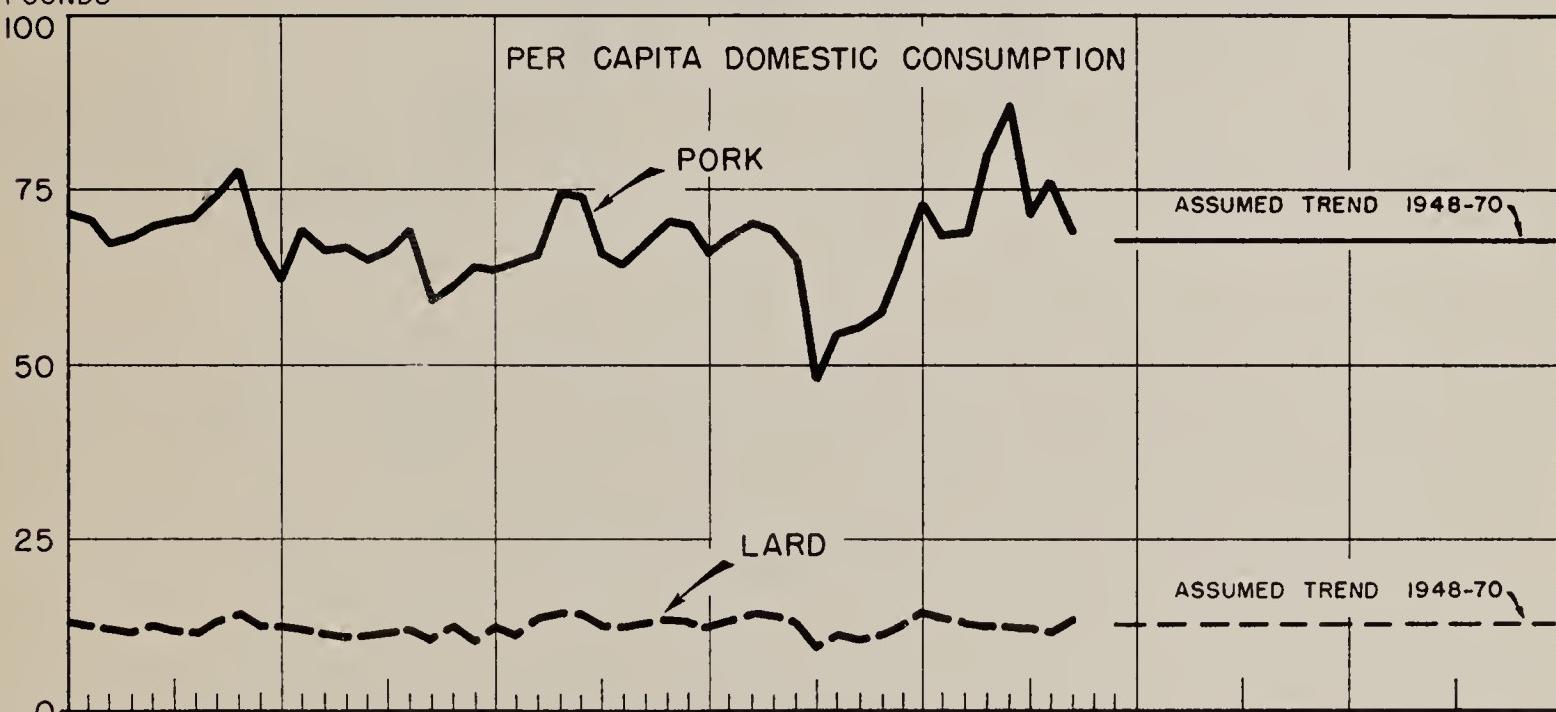
FIGURE 3

PORK AND LARD: TOTAL DOMESTIC CONSUMPTION,  
PER CAPITA DOMESTIC CONSUMPTION, AND  
TOTAL EXPORTS, UNITED STATES

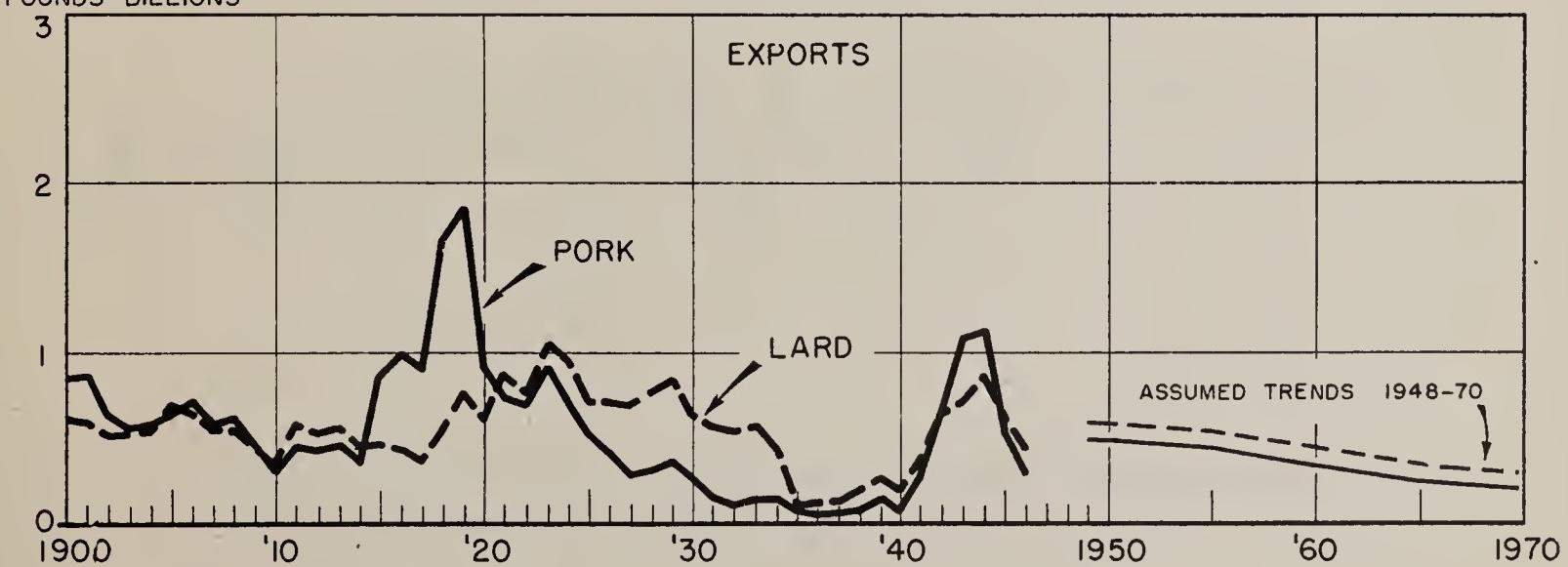
POUNDS-BILLIONS



POUNDS



POUNDS-BILLIONS



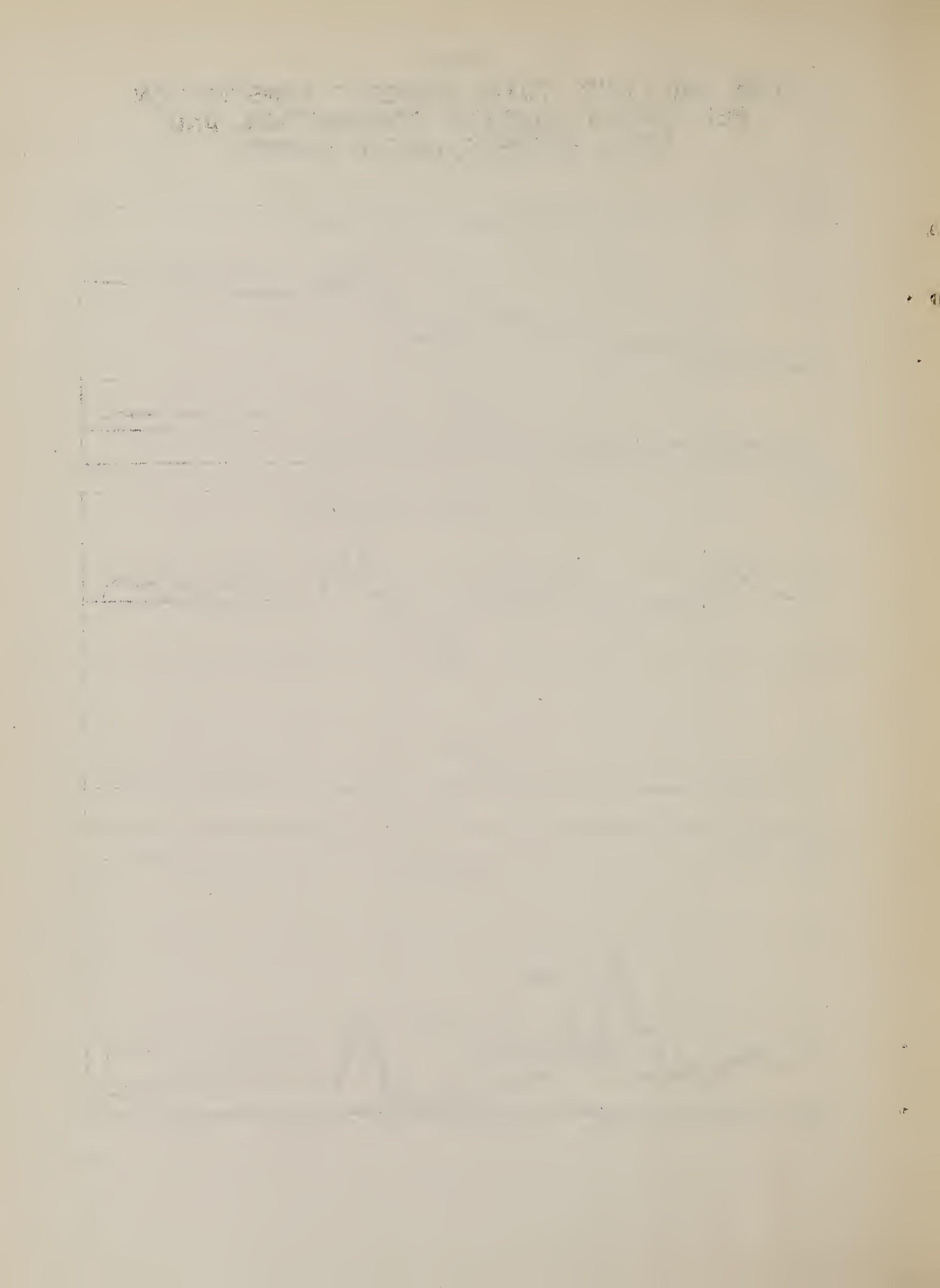
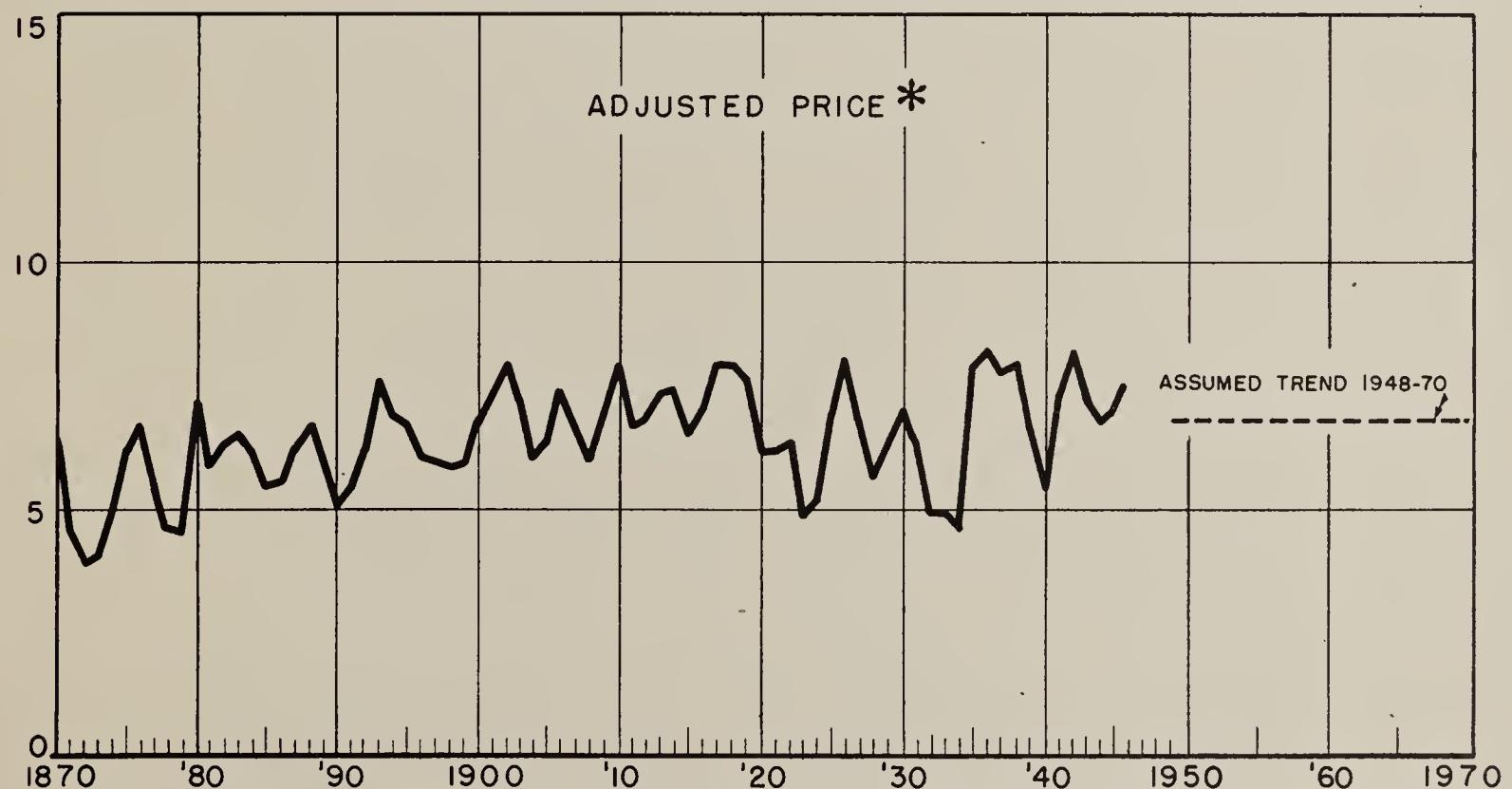
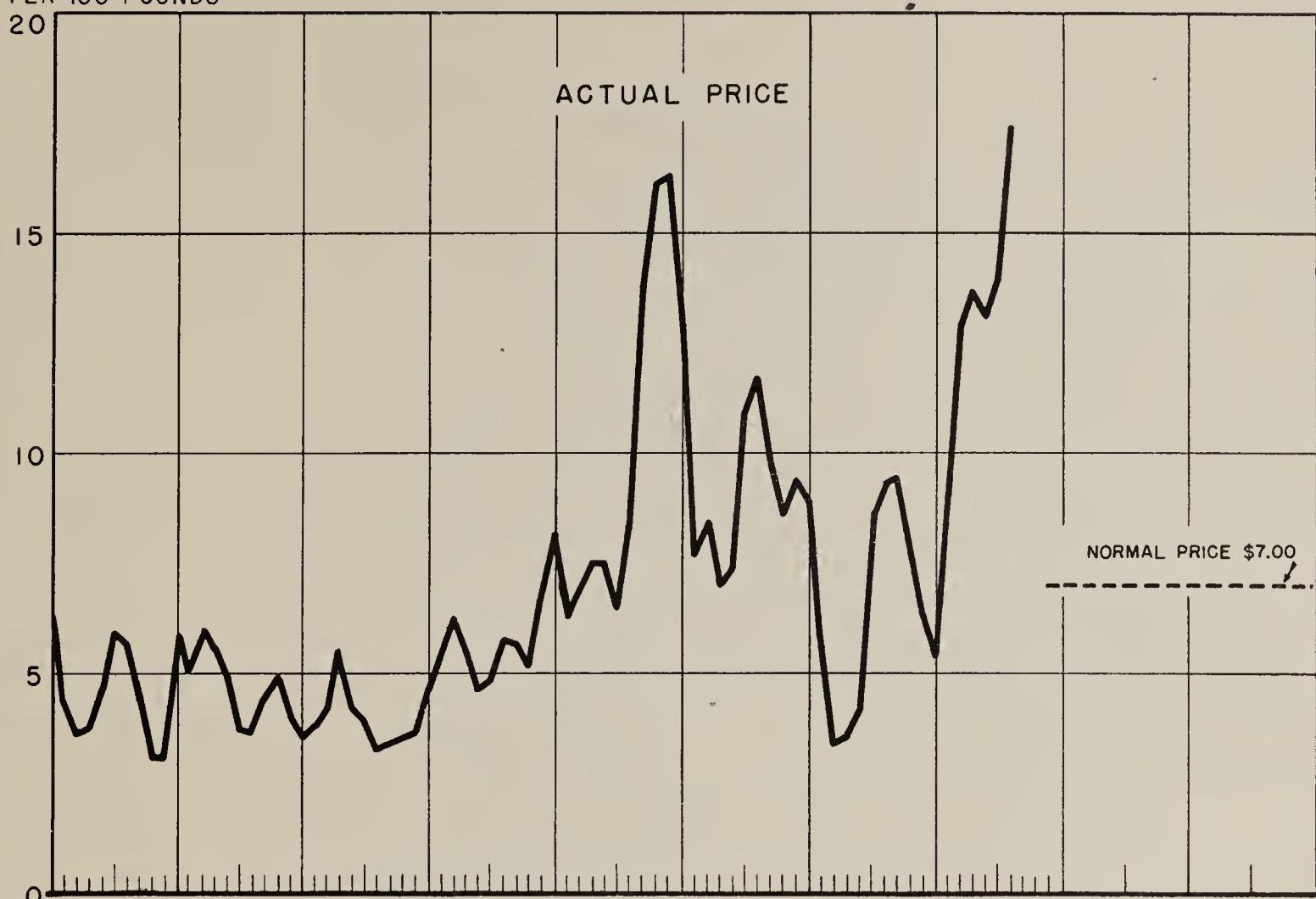


FIGURE 4

# HOGS: ACTUAL AND ADJUSTED PRICES RECEIVED BY FARMERS, UNITED STATES

DOLLARS  
PER 100 POUNDS



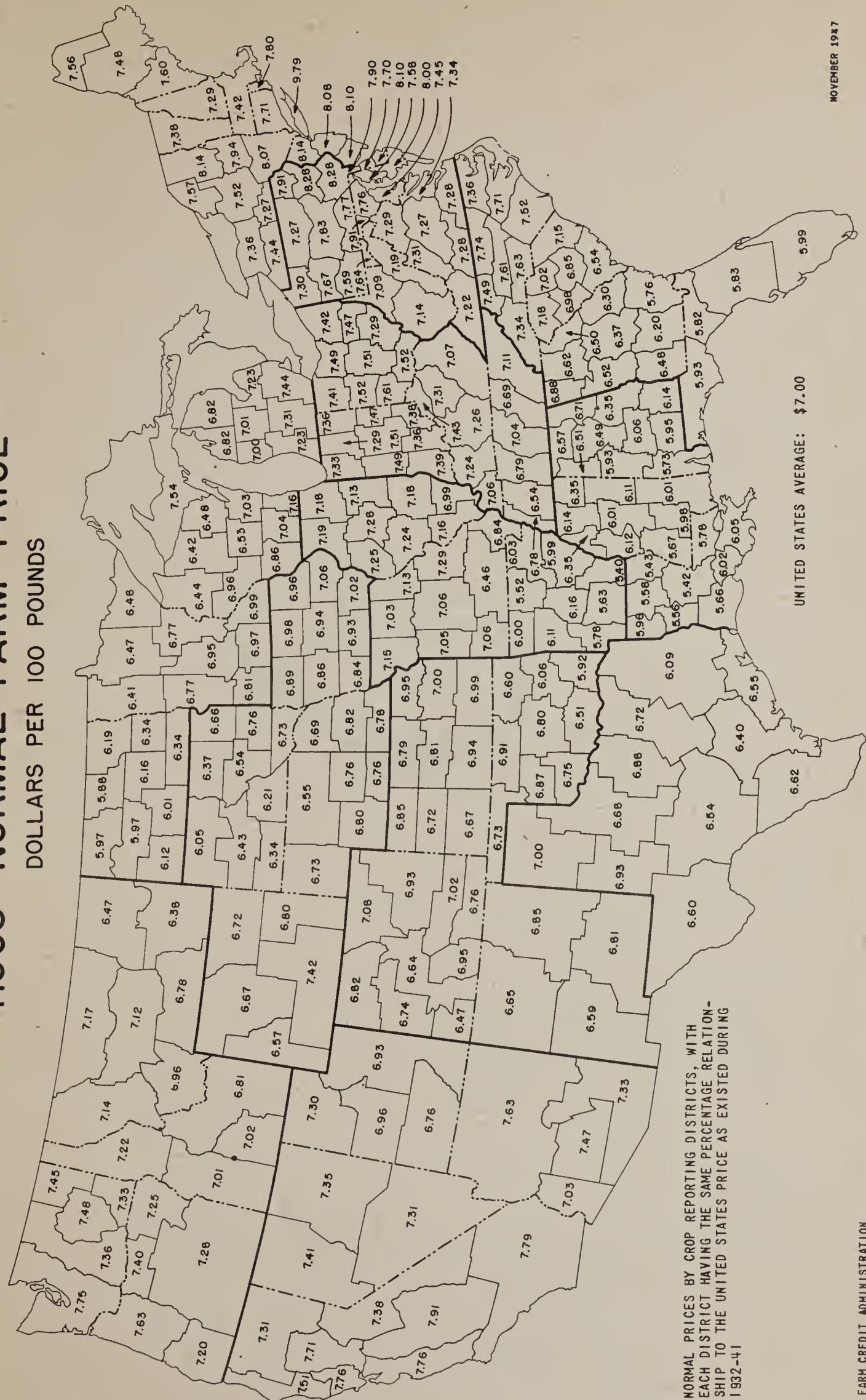
\*REPRESENTS ESTIMATE OF PRICE THAT WOULD HAVE BEEN RECEIVED IF THE INDEX OF ALL FARM PRICES HAD REMAINED CONSTANTLY AT A LEVEL EQUAL TO THE 1909-14 LEVEL



# HOGS: NORMAL FARM PRICE<sup>4</sup>

FIGURE 3

DOLLARS PER 100 POUNDS



▲ NORMAL PRICES BY CROP REPORTING DISTRICTS, WITH EACH DISTRICT HAVING THE SAME PERCENTAGE RELATIONSHIP TO THE UNITED STATES PRICE AS EXISTED DURING 1932-41

FARM CREDIT ADMINISTRATION

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